



NATIONAL TRANSPORTATION SAFETY BOARD

**Office of Aviation Safety
Western Pacific Region**

ON-SCENE and EXAMINATION INFORMATION

**NTSB Accident: WPR17FA013
Accident Date: October 25, 2016**

Examination Dates: Oct 25 – 28, 2016

This document contains 39 embedded images
Images courtesy Continental Motors, FAA, Google, NTSB, & Textron Aviation

A. ACCIDENT

Location: Pittsburg, California
Date: October 25, 2016
Aircraft: Beechcraft A36 'Bonanza', N364RM, Serial # E-2957
NTSB IIC: Michael Huhn

B. EXAMINATION PARTICIPANTS:

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C. SUMMARY

On October 25, 2016, about 1220 Pacific daylight time, a Textron Aviation (Beechcraft) A36 Bonanza, N364RM, was destroyed when it impacted powerlines and terrain in a steep descent shortly after departure from Buchanan Field Airport (CCR), Concord, California. The private pilot/owner and the certificated flight instructor (CFI) received fatal injuries. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed.

The airplane struck two high tension powerlines and then the ground. The powerlines were oriented approximately perpendicular to the flight path, and were struck about 300 feet prior to the ground impact point. About 50 fracture-separated sections of the airplane, consisting primarily of empennage and right wing fragments, were scattered below the powerlines, and in the field between the powerlines and the impact site. A post impact fire consumed most of the airplane at the impact site.

On-site and post-recovery examinations of the airplane indicated that all primary flight control surfaces were present at the time of the wire and/or ground impact.

No evidence consistent with in-flight fire, in-flight structural failure, catastrophic engine failure, or a bird strike was observed.

D. RESPONSE and SITE LOCATION INFORMATION

1.0 Response

- The accident occurred about 1220, in open, hilly terrain on a private ranch
- It was initially reported as a brush fire; First responders arrived on scene shortly thereafter, and reported that it was an airplane accident
- First responder agencies included the Contra Costa County Sheriff's Office, local fire and rescue agencies, and Pacific Gas & Electric ('PG&E', the powerline owner)
- FAA representative arrived about 1430
- First NTSB representative arrived about 1830
- All investigative personnel on site the day after the accident

2.0 Location

- Site elevation was approximately 590 feet MSL
- Geographic Coordinates
 - 37° 58' 12.95" N -121° 53' 45.24" W
- The impact location was about 7.95 miles from the departure (south) end of CCR runway 19R, on a bearing of 095° true (~081° magnetic) from that runway end
- The main impact site was located about 310 feet (horizontally) from the first powerline strike, on a bearing of 038° true (~024° magnetic)
- See separate document in NTSB public docket for additional powerline details



Figure 1 - Airport and Accident Locations

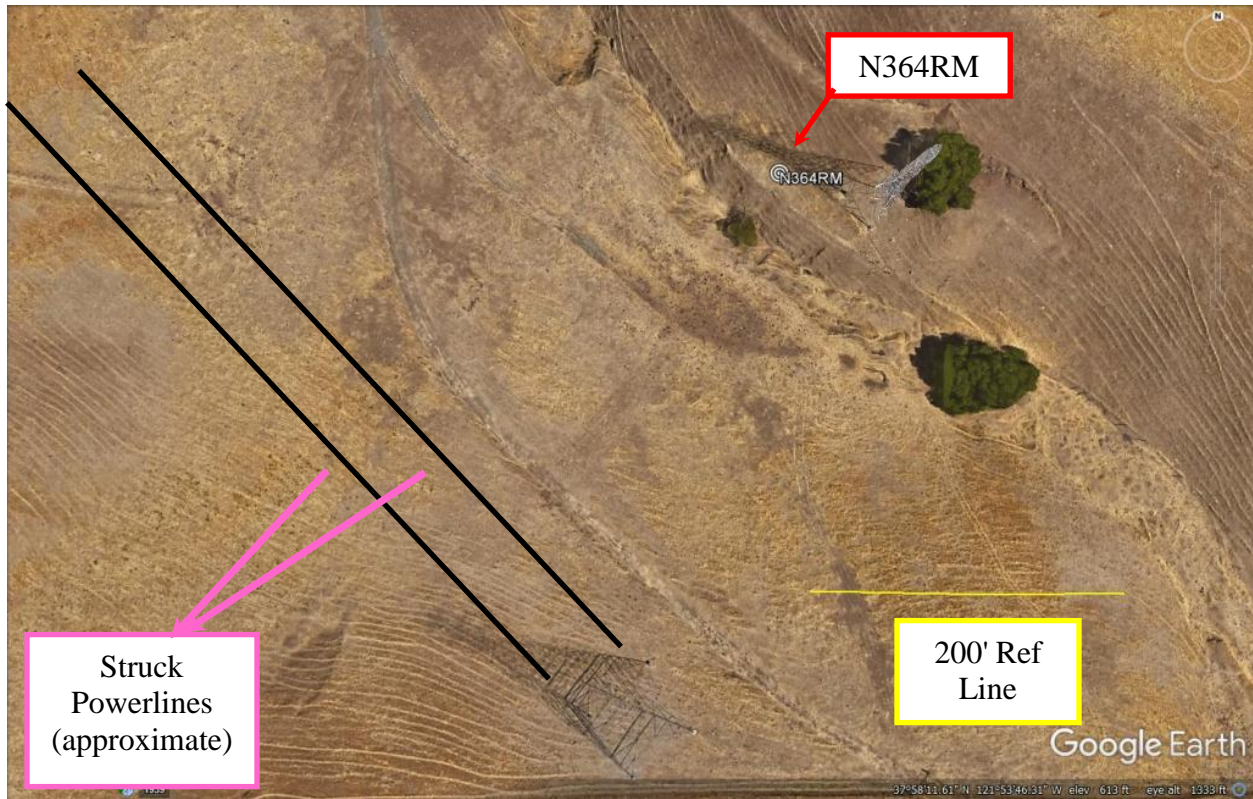


Figure 2 - Accident Site Orientation



Figure 3 - View with Impact Site (Note components in foreground)



Figure 4 - View Across Wreckage Path



Figure 5 - View with Powerline-separated Components



Figure 6 - View in Direction of Travel



Figure 7 - Impact Site and Wreckage



Figure 8 - Main Wreckage

3.0 Site and Ground Scar Information

- The wreckage was situated on steeply-sloping terrain on the northwest side face of a ravine
- A ground fire consumed much of the airplane, and spread to the dried grass that was present at the impact site. The affected/burned grass extended irregularly about 25 to 50 feet beyond the main wreckage
- Ground scar and wreckage distribution were consistent with the airplane striking the ground in a relatively steep trajectory, approximately perpendicular to the ravine face
 - The overall main wreckage distribution was generally consistent with the airplane coming to rest inverted, from a nose-over during/after impact
 - The ravine was approximately 25 feet deep, with walls that sloped between about 25 and 45 degrees from the horizontal

- The terrain northeast of the ravine continued to slope uphill for several hundred feet
- The terrain southwest of the ravine rose gently for several hundred feet
- The main wreckage was very tightly contained, approximately within the area of a circle the diameter of the wing span
- Some debris, including the engine and a portion of the outboard left wing, was found at the bottom of the ravine
- Aside from the main wreckage impact area, only one additional ground scar was observed
 - That scar was situated about half way between the powerline strike and main wreckage locations
 - The scar was a divot in the ground that measured about 6" wide, 3' long, and 5" deep



Figure 9 - Ground Scar Between Powerlines and Impact Site

E. POWERLINE-STRIKE SEPARATED PARTS

- About 50 powerline-strike separated parts were situated on the ground between the powerline strike location and the main wreckage
- The parts were catalogued in a database and then recovered
- The parts were re-assembled in a 2-D layout at the recovery facility
- Refer to separate documents in the NTSB public docket for detailed information regarding the parts database and also the 2-D layout and exam results

F. DETAILED EXAMINATION RESULTS

1.0 General

Due to the extensive impact and thermal damage, combined with the accident site topography, only limited examination of the wreckage was able to be accomplished on scene. The main wreckage was consistent with the airplane coming to rest inverted. During the recovery process, the wreckage 'layers' and components were examined, photographed, and segregated for post recovery examination. During the recovery, substantial efforts were made to ascertain flight control system continuity and integrity.

Post recovery examination included a 2-D layout of the major airframe (primarily flight control) components, and separate efforts regarding engine and propeller components.



Figure 10 - Main Wreckage Close-Up



Figure 11 - Main Wreckage Close-Up



Figure 12 - Main Wreckage Close-Up



Figure 13 - Main Wreckage Close-Up



Figure 14 - Components in Ravine

2.0 Flight Controls

The left aileron remained attached to the left wing, but exhibited crushing, tearing, and thermal damage. The right aileron was fracture-separated from the right wing and exhibited crushing and tearing damage. The right aileron fragments were found in the debris field between the powerlines and the impact site, and exhibited no thermal damage. The aileron trim actuator (installed left side only) extension was measured to be 1 5/8 inches, which equates to about 4° left aileron TED.

The left and right elevators were fracture-separated from their respective horizontal stabilizers, and were also torn/cut into several pieces. The elevator fragments were almost all found in the debris field between the powerlines and the impact site, and those pieces exhibited no thermal damage. No measurements of the left and right elevator trim actuators were possible due to impact and/or thermal damage.

The rudder was fracture-separated from the vertical stabilizer, in two primary sections. The section tear-line was a continuation of the fore-aft tear-line of the vertical stabilizer. The rudder fragments were found in the debris field between the powerlines and the impact site, and

exhibited no thermal damage. The airplane was not equipped with cockpit-controlled rudder trim.

Both flaps remained partially attached to their respective wings; all components were severely disrupted by impact and damaged/consumed by fire. Relative flap-wing positions were consistent with flaps retracted at impact. The left flap actuator extension was measured to be about 1 ½ inches, which equates to a flap extension of 0° (flaps up/retracted). No measurement was obtained from the right wing flap actuator due to impact damage.

Due to severe disruption of the airplane from impact, and then disruption and/or consumption by fire, only a coarse approximation of flight control continuity was able to be made.

- Two cables consistent with the aileron drive ('up' direction) were observed to extend from the apparent remnants of their respective aileron bellcranks to the cockpit area.
- One aileron drive cable was fracture separated (consistent with tensile overload) near the cockpit area.
- A cable consistent with the aileron balance cable was identified. It was fracture-separated at about the mid-cabin location. The separation end fractures were consistent with tensile overload
- Two cables consistent with the elevator cables were observed to run from the elevator aft bellcrank to the cockpit area
- Two cables consistent with the rudder drive cables were observed to run from the rudder aft bellcrank to the cockpit area
 - The right rudder cable was continuous throughout its length
 - The left rudder cable exhibited a fracture separation consistent with tensile overload, about 3 feet forward of the rudder aft bellcrank



Figure 15 - Left Aileron



Figure 16 - Left Aileron Trim Actuator



Figure 17 - Right Aileron



Figure 18 - Right Aileron Bellcrank



Figure 19 - Aileron Cables



Figure 20 - Aileron Cables

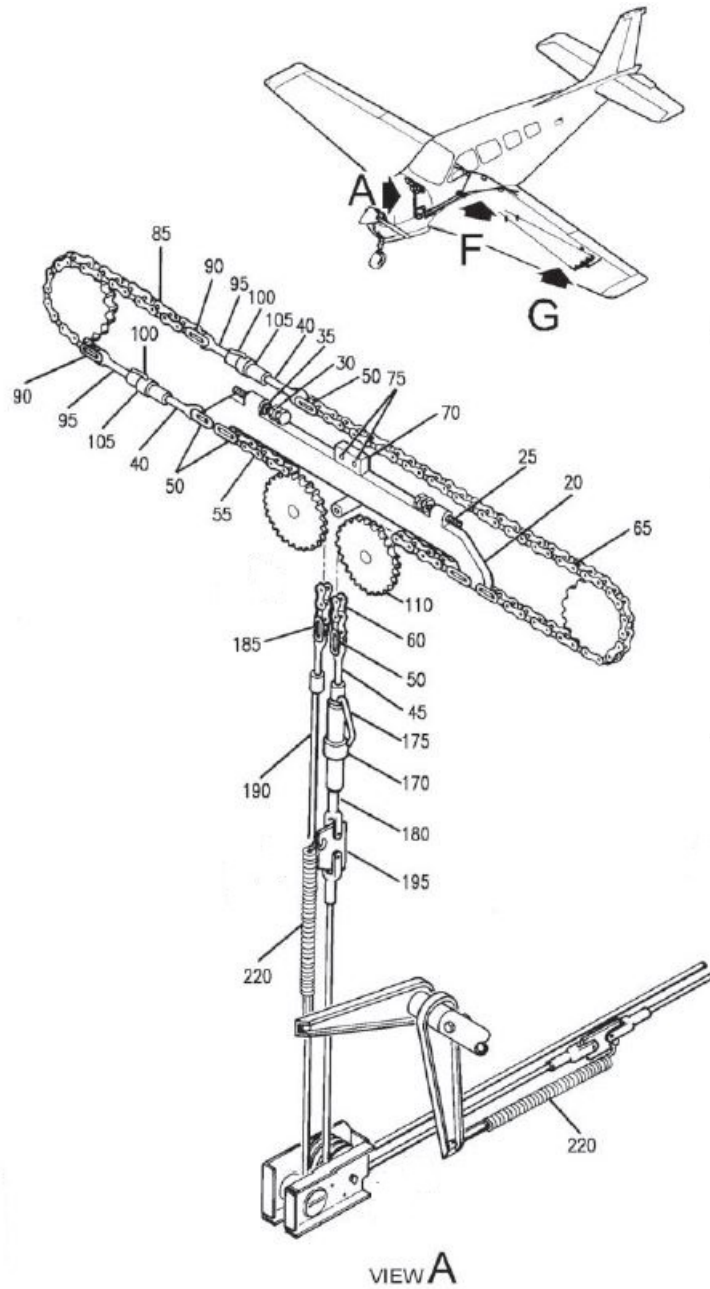


Figure 21 - Aileron Cockpit Linkage



Figure 22 - Left Wing Flap



Figure 23 - Right Wing Flap



Figure 24 - Right Flap Actuator



Figure 25 - Aft Elevator Bellcrank



Figure 26 - Elevator Cable

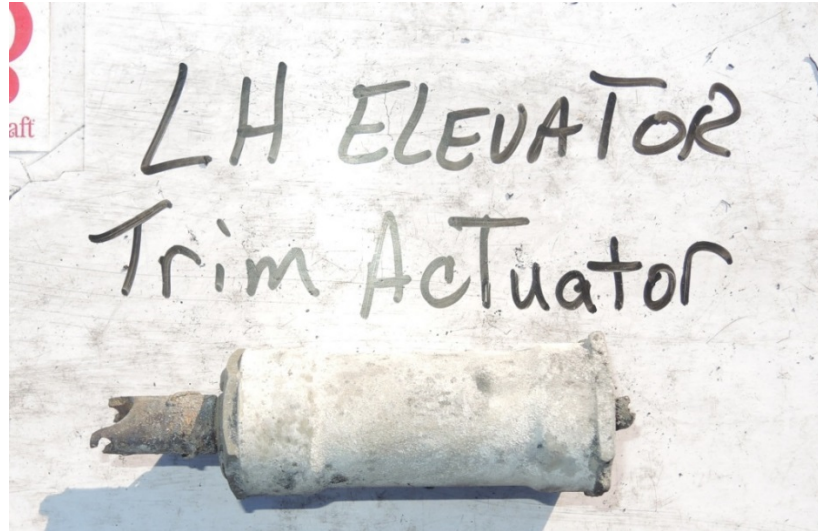


Figure 27 - Left Elevator Trim Actuator



Figure 28 - Rudder Cables



Figure 29 - Rudder Bellcrank

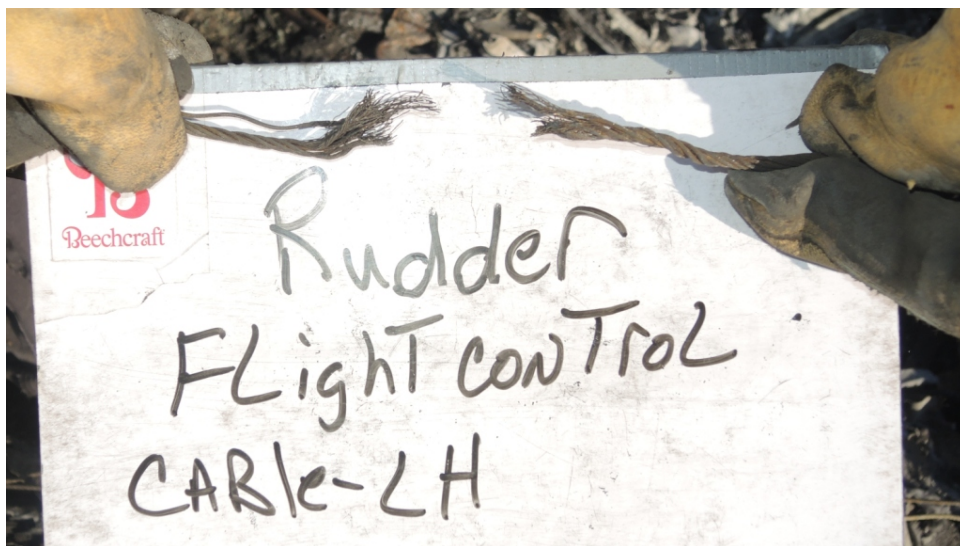


Figure 30 - Left Rudder Cable

3.0 Fuel System

Although some components or fragments of components were able to be identified, impact and thermal damage precluded the determination of the integrity, functionality, or settings of any portions of the fuel system.

4.0 Landing Gear

The landing gear cockpit controls and indicators, and most landing gear components, sustained significant impact and/or thermal damage, and yielded almost no useful information. However, both the nose and main landing gear actuator configurations were consistent with the landing gear being retracted at the time of impact.

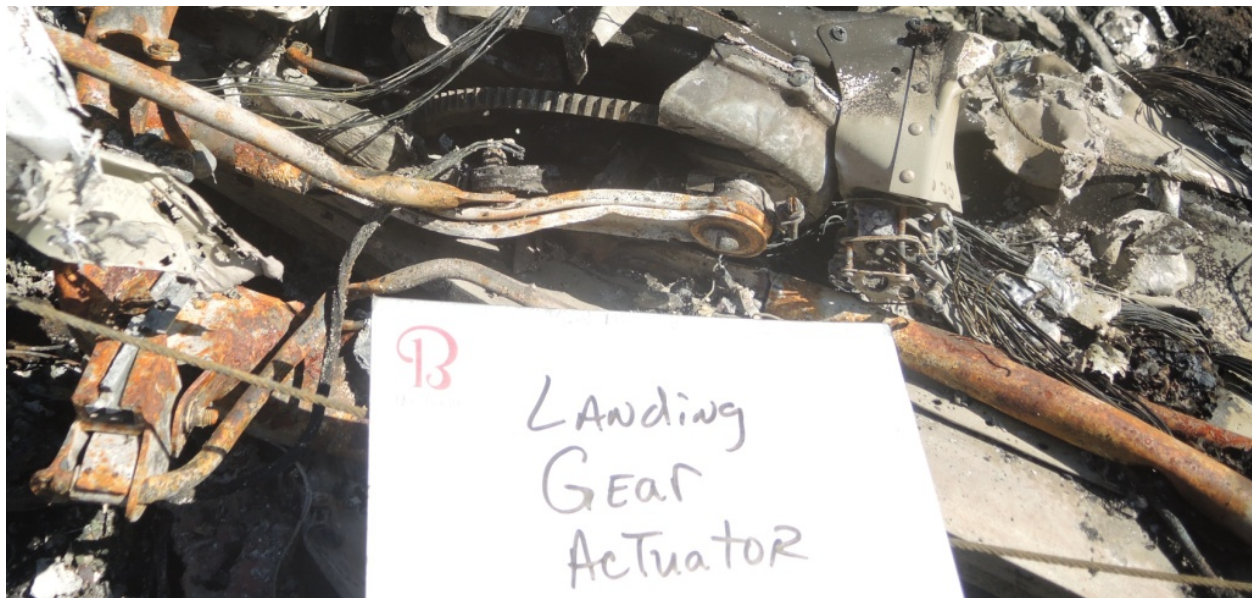


Figure 31 - Landing Gear Actuator

5.0 Other Systems

Portions of flight, navigation, or engine instruments, electrical switches, circuit breakers, and avionics devices, were observed in the wreckage, but no information regarding the integrity, functionality, operational status, or indications/settings of any of those systems or subsystems was able to be determined.

Impact and thermal damage precluded any determination of the functionality or employment of occupant restraint systems and seat integrity, but the impact damage was consistent with a non-survivable deceleration.

Portions of a closed-cycle cabin air conditioning system were observed in the wreckage, but no information regarding the integrity, functionality, or operational status of that or any cabin environmental control systems was able to be determined.

Fractured and/or thermally damaged portions of the ELT were observed in the wreckage; their condition was consistent with complete destruction of the unit.

G. ENGINE and PROPELLER

1.0 Engine

- The airplane was equipped with a Continental Motors IO-520 that was field converted to a TIO 550 (550-B-AP) series, including a Tornado Alley brand turbocharger
- The engine was located at the bottom of the ravine, about 15 feet downslope of where it impacted (based on propeller witness marks in the soil)
- The engine sustained significant impact damage, and thermal damage consistent with the post impact fire
- The crankcase was fractured, the crankshaft was bent, and the propeller was fracture-separated from the engine
- Most accessories were fracture-separated from the engine
 - All sustained severe impact damage
 - Most also sustained thermal damage consistent with a post impact fire
 - No information regarding the integrity, functionality, or operational status of any of those accessories was able to be determined.
- No evidence of any pre-impact engine or engine component failures was observed
- No direct information regarding the engine functionality or operational status was able to be determined



Figure 32 - Engine



Figure 33 - Engine Data Plate



Figure 34 - Engine Accessories



Figure 35 - Engine Accessories

2.0 Propeller

- The airplane was equipped with a Hartzell model PHC-C3YF-1RF three-blade, all-metal propeller
- All three blades were recovered at the main wreckage site
 - Two were in close proximity to one another, near the 'bottom' layer of main wreckage debris
 - One was found in the bottom of the ravine, about 15 feet from the other two
- Two blades were fracture-separated from the propeller hub, which was fractured into numerous pieces
- All three blades were missing about $\frac{3}{4}$ " to 1-1/2" from their tips; those three tips were never identified in the wreckage
- All three blades displayed relatively minimal shape deformation
- During recovery, a distinct paint-transfer of the black and white paint from one propeller blade was observed imprinted on the compressed soil of the accident site
- No evidence of any pre-impact failure of the propeller or its components and controls was observed

- No direct information regarding the propeller functionality or operational status was able to be determined



Figure 36 - Propeller Blades and Hub Fragment



Figure 37 - Propeller Blades and Hub Fragment



Figure 38 - Propeller Blade Paint Transfer

H. ONBOARD DOCUMENTS

- Two soft-sided cases/bags came to rest outside the aircraft, and relatively clear of the fire
- They contained a large quantity of airplane- and flight related documents
- The documents were impact- and water-damaged, but generally intact
- No pilot logs were observed in the wreckage
- A large quantity of maintenance records was on board the airplane at the time of the accident; and survived in relatively good condition
 - The most recent annual inspection was completed in May 2016, at which time the airplane had about 2,626 total hours in service
 - The engine maintenance records indicated that the engine had about 2,382 total hours in service, and 681 hours since major overhaul, at the time of the annual inspection
- Refer to separate document for excerpted maintenance records
- A significant number of avionics manuals were also onboard the airplane, and recovered relatively intact at the site
- Although a portion of the avionics suite had reportedly just been upgraded a few days prior to the flight, no associated maintenance records or other documentation was observed in the wreckage

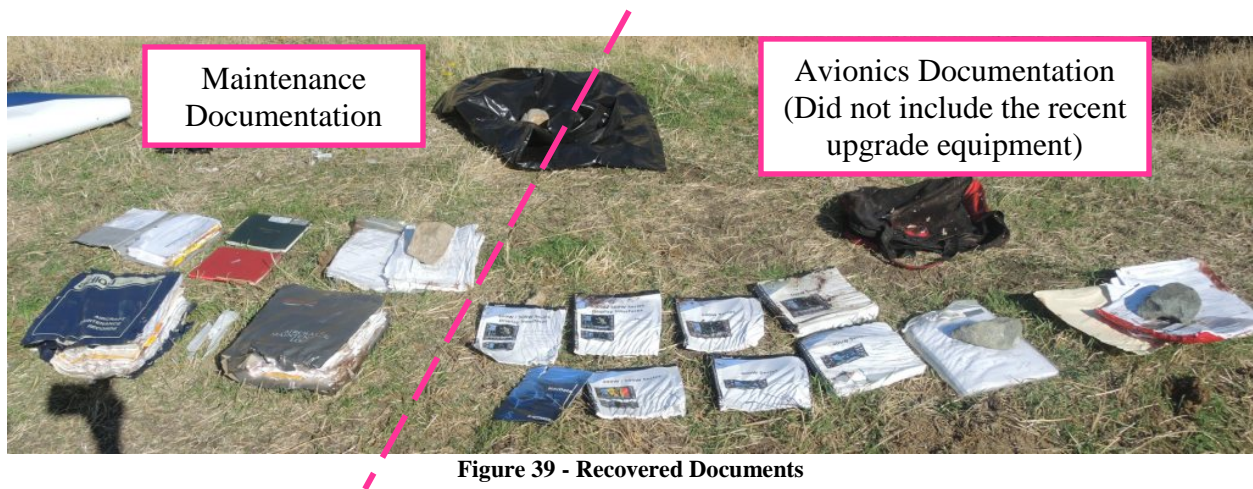


Figure 39 - Recovered Documents